

gobar times

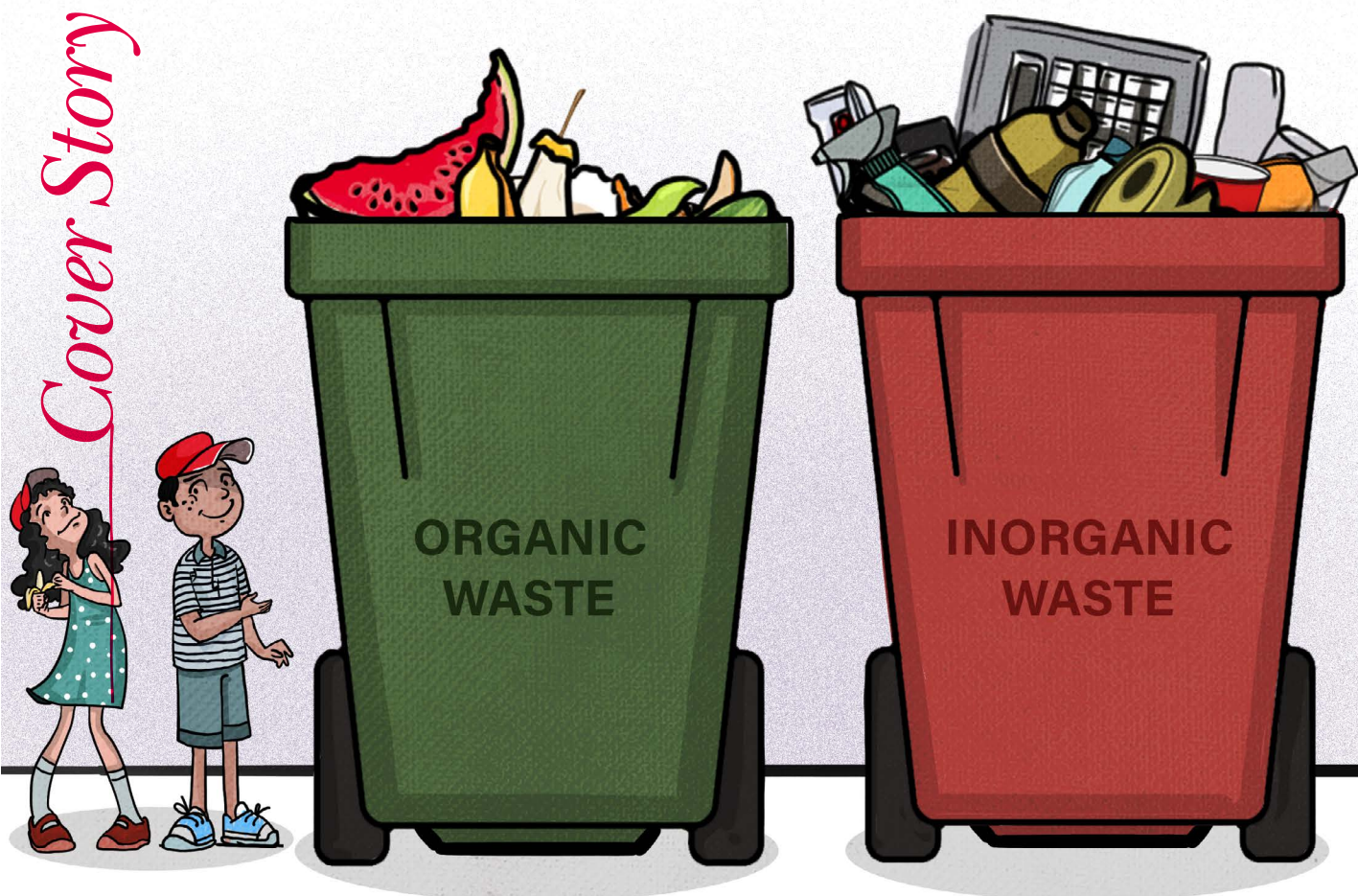
ISSUE NO: 263, April 1-30, 2024

A DOWN TO EARTH SUPPLEMENT FOR THE YOUNG AND CURIOUS

THE MAGIC FUEL

Understanding biofuels, and what clean
and green energy is about.





Dr Rahul Jain

Bio... whaaa? Fuels?

A future fuelled by biofuels is far better than that fired on fossil fuels. Read why biofuels are a panacea for reducing air pollution caused through automobiles and farm fields, how they help manage farm waste, and enhance soil health.

Rahul: Hey Anu! You look disgusted. Not knowing what to do about these monumental, stinking garbage bins?

Anu: Yeah, dude! Why don't people deliberate upon solution-seeking rather than piling their sins right outside their homes!? Household waste has a lot of organic waste and am sure there are ways of dealing with it!

Rahul: Of course, there are. What are the two main types of waste you know?

Anu: Well? There's organic and inorganic. Food scraps and garden waste is organic. Inorganic waste includes things that I can't eat, like plastic, metal, and electronics. Just look at the filth around us and you'll know.

Rahul: But are you aware of some more types of organic waste?

Anu: Umm... There's animal waste, farm leftover, sugarcane processing waste and more.

Rahul: Pretty good, girl! And did you know that these wastes can be turned into something cool?

Anu: Really? Like what?...

Rahul: They can be converted into biofuels, which are like eco-friendly fuels. They can replace the regular fuels people use for cars and stuff. They are greener because they cause less pollution when burnt. Also, producing them solves our country's waste-management problem.

Anu: That sounds like a magic fuel!

Rahul: Haha! Let me unravel further. Take agricultural waste, for example. Instead of burning it to clear farm fields and polluting the air unforgivingly, we can use it to make biofuels. Even in cities, if we turn these big piles of household waste into biofuel, we can get rid of our smelly landfills easily. And then we might even have a clean place to chit-chat!

Anu: That's relieving! I'd no idea about baayoofooellllzzz... How are they manufactured?

Rahul: Well, different kinds of biofuels are produced differently. Check out these interactive flashcards from [Gobar Times](#)! Click upon any photograph here and read info about it in a pop-up bubble. You better download and read this magazine every month to gather some comprehensive *gyan* on environmental issues.

Anu: Your flashcards are really awesome, Rahul! But can you tell how biogas is different from Compressed Biogas (CBG)?

Rahul: Well, biogas is made through 'anaerobic digestion.' This means that tiny living things, which you can't see without a microscope, break down organic waste without using oxygen. The gas produced as a result contains mostly methane, some carbon dioxide, and a bit of other stuff. Have you ever seen any plants in villages? They use cow dung to make biogas, which is usually used for cooking.

Anu: Oh yeah, I remember seeing one during my school trip to rural places. But what about CBG?

Rahul: CBG is like a purified and modern biogas. Scientists use technology to filter out the extra gases from biogas, leaving behind only methane. That's what we call CBG and it can power vehicles that run on CNG. CNG means Compressed Natural Gas.

Anu: Cee bee gee...



Cover Story

cee... enn... gee...! Lol! Lots of cee gees... So, tell me something: won't there be any issue if we put biogas into a vehicle that otherwise runs on natural gas? Will its system not malfunction?

Rahul: Nope, Anu! Since CNG and CBG are both methane, no changes are needed.

Anu: Amazing! So, a CNG-based autorickshaw... those yellow-green ones in Delhi can run on both CNG and CBG fuel?

Rahul: That's right!

Anu: Ah! So, why is CBG not a craze till now?

Rahul: Well, CBG is gradually gaining popularity. Around 80 CBG plants are working in India, turning various kinds of wastes into gas.

Anu: That's seems like a small number for a country like ours. Is setting up biofuel plants a big task? What's the issue? Is the government doing anything about it?

Rahul: Definitely! In 2018, the Indian government introduced the National Biofuel Policy to provide incentives and support to biofuel plants. Additionally, the Ministry of Petroleum

and Natural Gas initiated a scheme called SATAT, which stands for Sustainable Alternative Towards Affordable Transportation. Its goal was to set up 5,000 CBG projects across India by 2023-24.

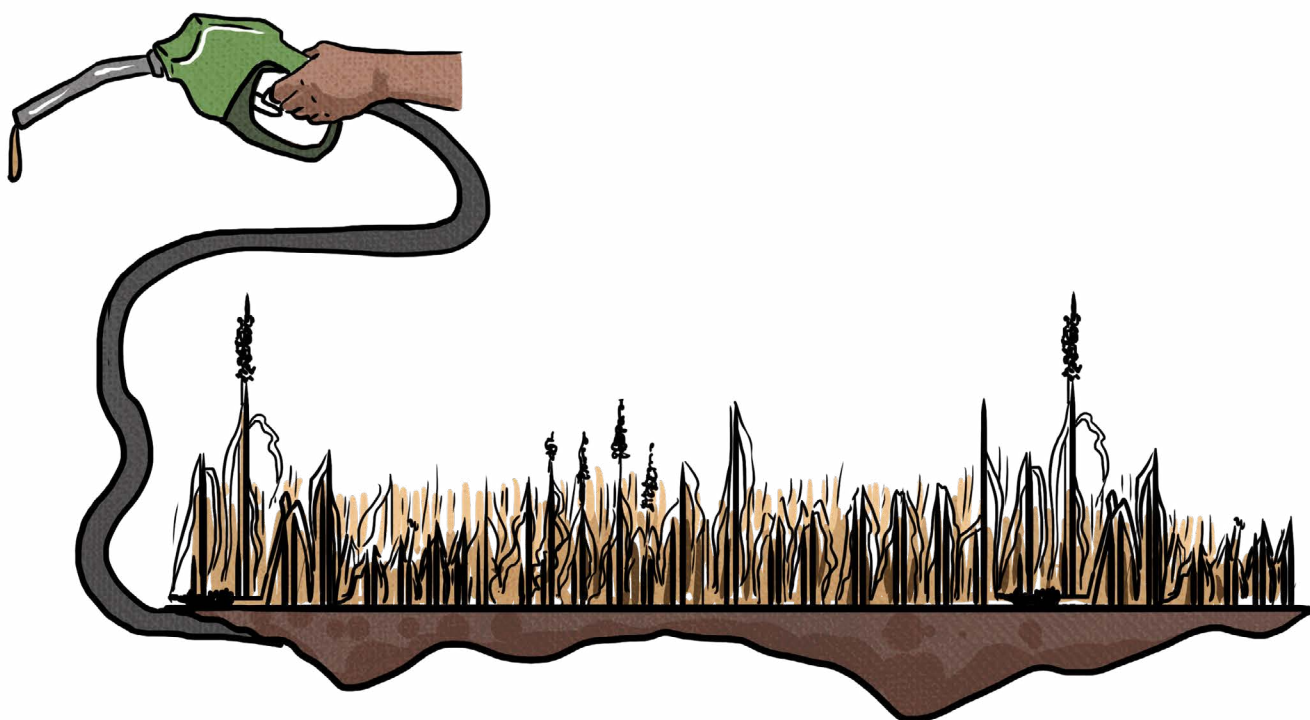
Anu: But we're already completed the first quarter of 2024 with barely 80 plants on ground...

Rahul: Yup. Unfortunately, due to the COVID-19 and limited awareness about SATAT among investors, we had to postpone the target of 5,000 projects to 2030.

Anu: Fine... Can you show me around any such plant? Am already curious now.

Rahul: Sure! India's biggest CBG plant is installed in Punjab, the state popular as the food bowl of our country, because it produces ample amount of wheat and rice. However, the crop waste remaining in its fields is typically burnt, causing air pollution, especially noticeable in Delhi NCR during winters.

Anu: Awh!... I remember seeing that astonishing haze spreading all over Delhi's skyline during my trip last year. Indeed, it is our national pollution capital!



Cover Story

Rahul: So, to address that menace, biofuels come into play. The biofuel plant in Punjab that am referring to was built by a German company and started its operations in October 2022. The plant collects crop waste from farms and stores it in large bundles on-site. Then it processes 300 tons of crop waste daily—equivalent to 3,00,000 kg—and produces CBG.

Anu: That's a huge number! And how much CBG does it produce?

Rahul: It generates about 33 tons of CBG daily. And what's fascinating is that it also releases a by-product called Fermented Organic Manure (FOM).

Anu: OMG! Let me process so many numbers first!... So, simply put, this plant takes in 300 tons of crop waste and gives out 33 tons of CBG every single day... Wow! That feels like sweeping away crop waste from the fields entirely!

Rahul: Not only that, the CBG produced is also sold to the nearby fueling stations as an eco-friendly fuel for cars. This is how biofuels transform waste into energy!

Anu: Ahaaa! And, what's FOM that you mentioned?

Rahul: FOM is an organic fertilizer that improves soil quality. The FOM produced at this plant is returned to the farmers, who use it to enhance their crop yields.

Anu: Oh, that's incredible! Biofuels are a bonanza!

In this plant, first, waste goes from the farms to the plant and then fertilizer comes out from the plant to the farms. And CBG, of course, comes out from the plant and but goes further ahead to the fueling stations.

Rahul: You nailed it!

Anu: Thanks a lot, Rahul! This conversation is literally *gobar gyan* for me and I shall pledge not to miss a single edition of *Gobar Times*!

Rahul: Absolutely! *Gobar Times* is the best way to learn about every environmental issue in a fun-filled way. Subscribe it through the [Young Environmentalist](#) website!

*The author is Deputy Programme Manager,
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Environment, New Delhi.*

EK PRAAYAS

BOOK REVIEW



Nandita
Banerji

Simple stories by Shaurya Kabra, an astute high-schooler, who demystifies the scary world of money.

Shaurya Kabra's *Ek Praay* takes on a bold journey—giving young individuals financial knowledge through the fairy tales of yore. The book by the 16-year-old presents a short story collection inspired by tales like *Hansel and Gretel*, *Cinderella* and *Jack and the Beanstalk*, but with an Indian context. Named after an initiative by Kabra, the book simplifies concepts like, budgeting, saving, interest, and how money works by creatively using six children's stories. While the book is a brave attempt at clarifying the complex world of finance, the stories seem a little lacking and could have been better fleshed out.

The first tale, *Harish and Geeta learn How to Budget*, tells how two children survive on a hundred *laddoos* each while finding their way

back home. Kabra uses the metaphor of sweets to explain how planning and budgeting of money proves helpful during bad days.

Magic of Compounding beautifully explains compound interest through the example of a tree. The author compares reinvestment of earnings to giving fertiliser to a tree and the fruits multiplying, as a result, with the interest that the protagonist Jay reaps and sells.

A vegetable-seller Bholu learns about savings and current accounts in *Bank Services*. Principal amount, deposit, installment, and the differences between investment and reinvestment, are also unravelled in an easy-to-understand manner.

King Vikram Singh and his Worthless Currency provides an alternate view of the classic *King Midas and his golden touch*. While the original was about a foolish and greedy king, here the King Vikram is extremely philanthropic. So much so that he destroys the value of gold by making it too common. Hence, the rare silk and satin becomes more valuable to the people of his kingdom than gold. This take on supply and demand, interestingly, links price with the availability of an object.

The plot of *Gori's Lesson on Debt* is a driven retelling of *Cinderella*, with a hint of *Snow White and the Seven Dwarves* and maybe even *Beauty and the Beast*. Mistreated by her stepfamily for being too pretty, an old woman is Gori's only friend, much like a realistic Fairy Godmother. She lends her money for a glamorous gown to attend a fancy event hosted at the king's castle. The maiden enthralls the king and the couple gets married. But Gori refuses to pay back the old woman, who curses Gori and punishes her to return to poverty again. This story is a great lesson on how defaulting on loans can pile up a crushing debt. It is also oddly chilling, like the original versions of the Brothers Grimm, which were much grittier than the current counterparts.

The last story, *Mohan's Important Discovery*, highlights the risk of minimising risks too much. The young Mohan follows the idiom of not putting all eggs in one basket very seriously and saves all his cookies smartly. Though, one wonders about the army of ants marching in his house.

If storytelling can compound your interest at handling finances, then *Ek Praayas* can be your next investment.

The author is a Senior Sub-Editor for Down To Earth (Web), Centre for Science and Environment, New Delhi.





**Gandrothu Gana
Srilakshmi**

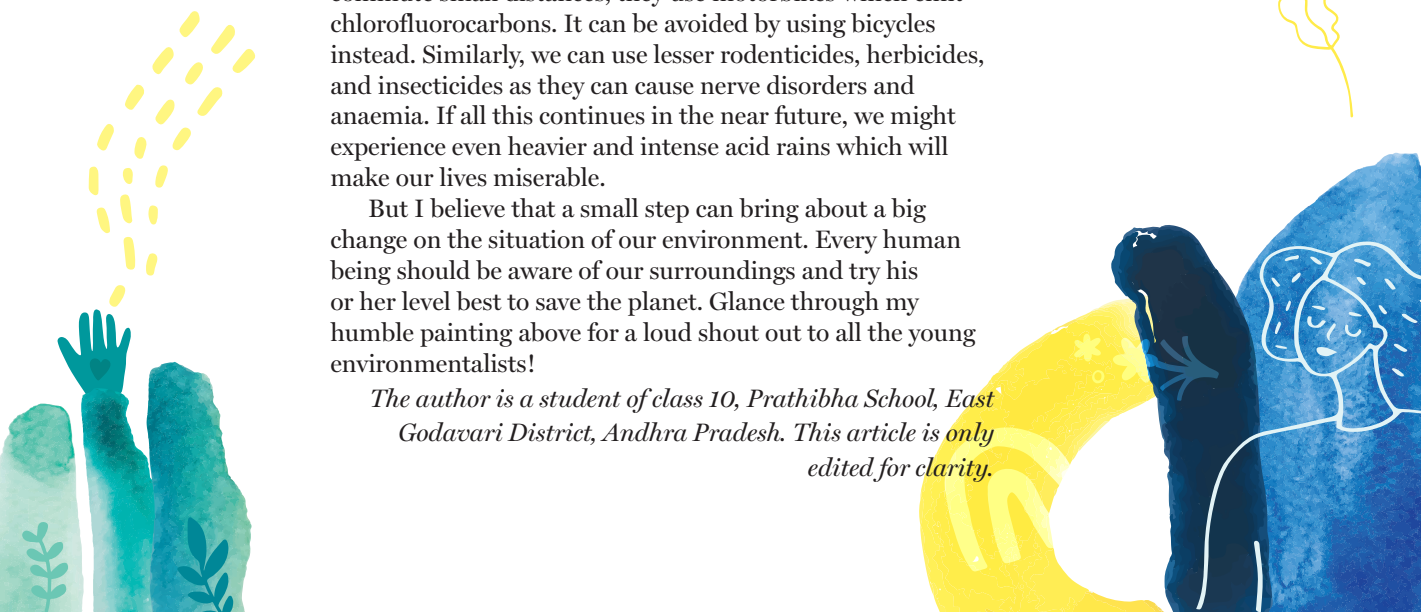
A brief and innocent appeal to rescue the environment through a thought-provoking painting.

None of us recognise the effects of environmental degradation before we witness them. But experience is the best teacher. If we do not stop spoiling the environment, we will have to bear its consequences.

Drastic changes in climate and temperature happening nowadays are symptoms of the huge damage caused to the environment. The greenhouse effect, soil erosion, and corrosion of buildings provides us further evidence. Not only industrialization but also our living habits harm the environment. And not just the laymen but also educated people are to be blamed for it. For example, just to commute small distances, they use motorbikes which emit chlorofluorocarbons. It can be avoided by using bicycles instead. Similarly, we can use lesser rodenticides, herbicides, and insecticides as they can cause nerve disorders and anaemia. If all this continues in the near future, we might experience even heavier and intense acid rains which will make our lives miserable.

But I believe that a small step can bring about a big change on the situation of our environment. Every human being should be aware of our surroundings and try his or her level best to save the planet. Glance through my humble painting above for a loud shout out to all the young environmentalists!

The author is a student of class 10, Prathibha School, East Godavari District, Andhra Pradesh. This article is only edited for clarity.





SHAITAAN

Have you ever heard of **virtual autism**? It's a concern emerging among children who spend an excessive amount of time in front a screen. Its symptoms include hyperactivity, attention deficiency, lack of interest in non-digital games, delay in speech, reluctance in interaction, irritability, mood swings, and difficulty in learning anything new. Virtual autism is not a diagnosis like Autism Spectrum Disorder (ASD) but a term encompassing symptoms that resemble ASD. However, the sooner kids move away from screens and become active in the real world, positive changes are visible.